

# CIERA

Community Initiative for Emissions Research and Applications

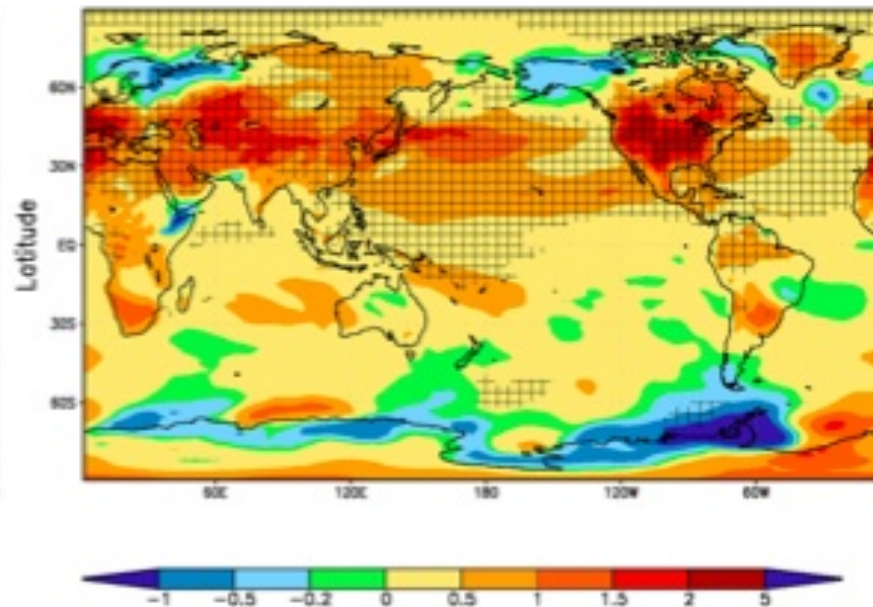
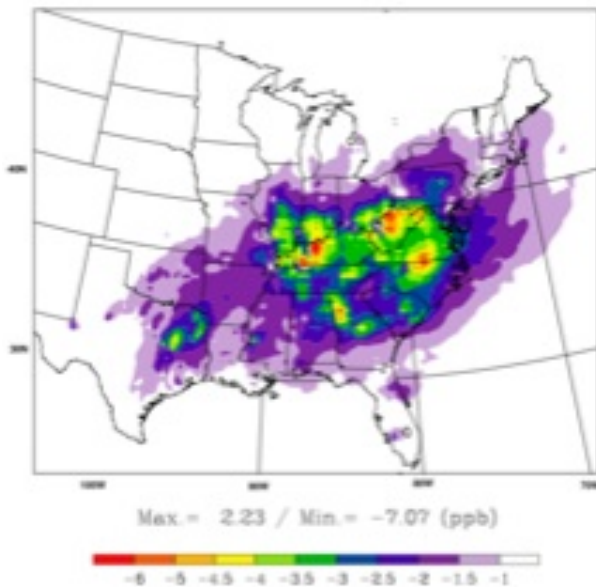
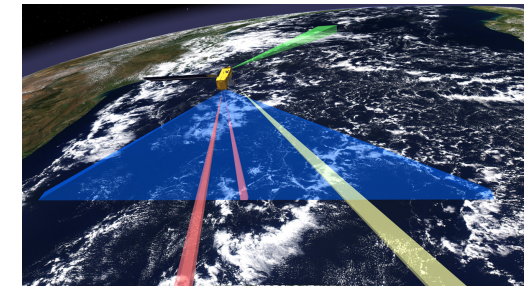
Gregory J. Frost, Claire Granier, Jean-François Lamarque,  
Gabrielle Pétron, Steven J. Smith, Megan L. Melamed,  
Paulette Middleton, Stefan Falke, Terry Keating

## ***Outline for this presentation***

- Motivation
- Vision
- Recent progress
- How you can contribute

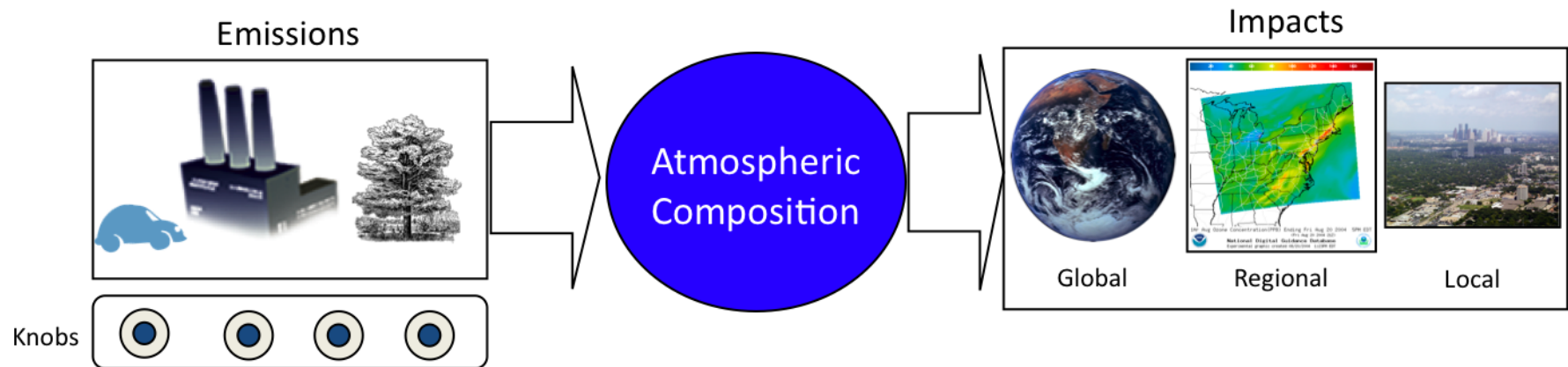
# Emissions in AQ and Climate Research

- Air quality and climate science research community
  - Users and producers of emissions data
  - Observations, modeling, and analysis
  - Local, national, regional, and global scales
  - Past, present, and future emissions
- Research topics
  - Top-down estimates of emissions
  - Identifying emission sources
  - Understanding emission changes
  - Impacts on AQ and climate



# The Big Picture

*Actions and decisions about atmospheric composition focus on emissions*

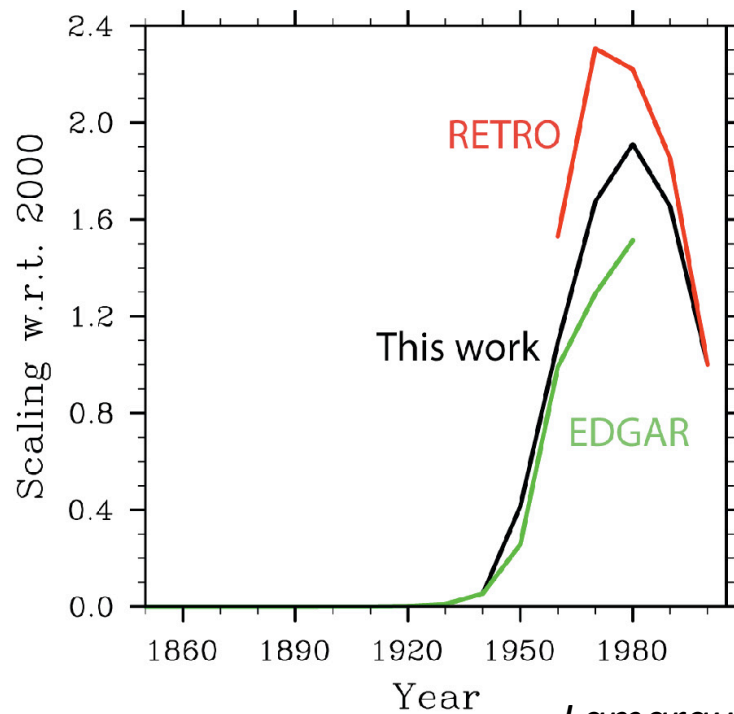


- Emission inventories for air quality and climate
  - essential tools for research and regulation
  - incorporate variety of species, sources, and temporal-spatial scales
  - must be accurate, timely, and traceable
- Research and regulatory emissions development follow different paths
  - *Are current emissions data meeting our needs?*
  - *How can these data be improved while maximizing sparse resources?*

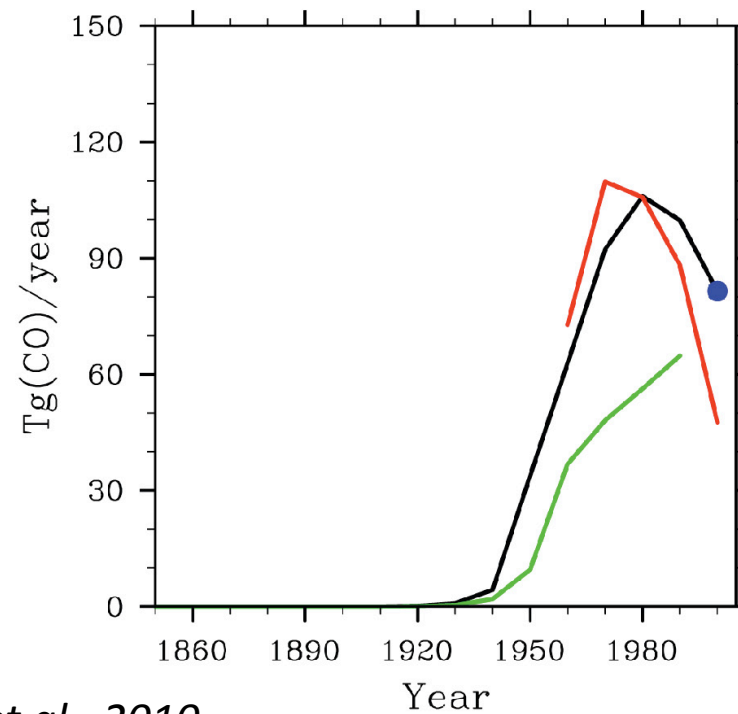
# Inventory Development Issues

- Structural inconsistencies
- Time lags
- Changes to methodology over time
- Traceability and documentation

CMIP5/IPCC AR5 research inventory



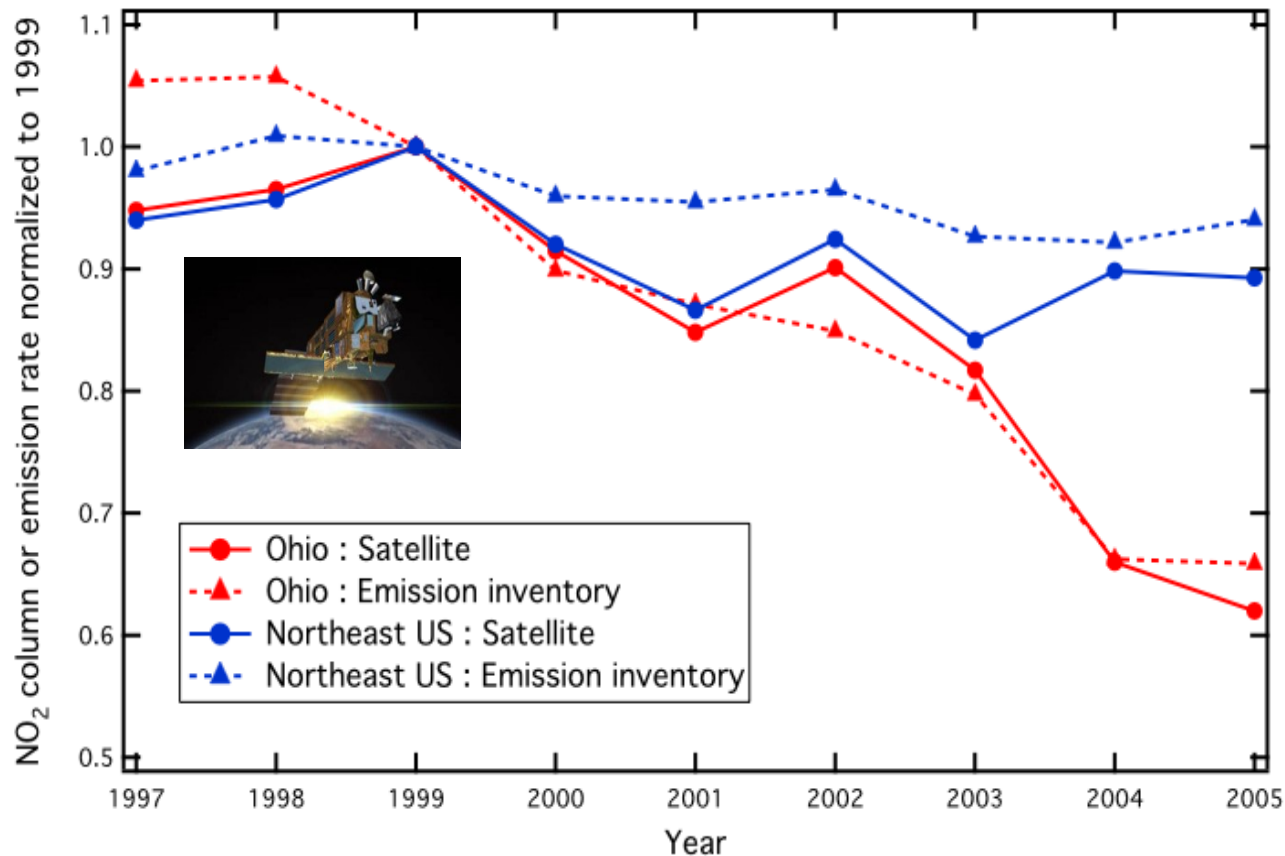
*Lamarque et al., 2010*



# Emission Data Evaluations and Analyses

- Systematic evaluations using observations and models
- Uncertainty estimates
- Comparison of different approaches
- AQ and climate impacts of improved and evolving inventories

Evaluating NO<sub>x</sub> emissions with satellite data

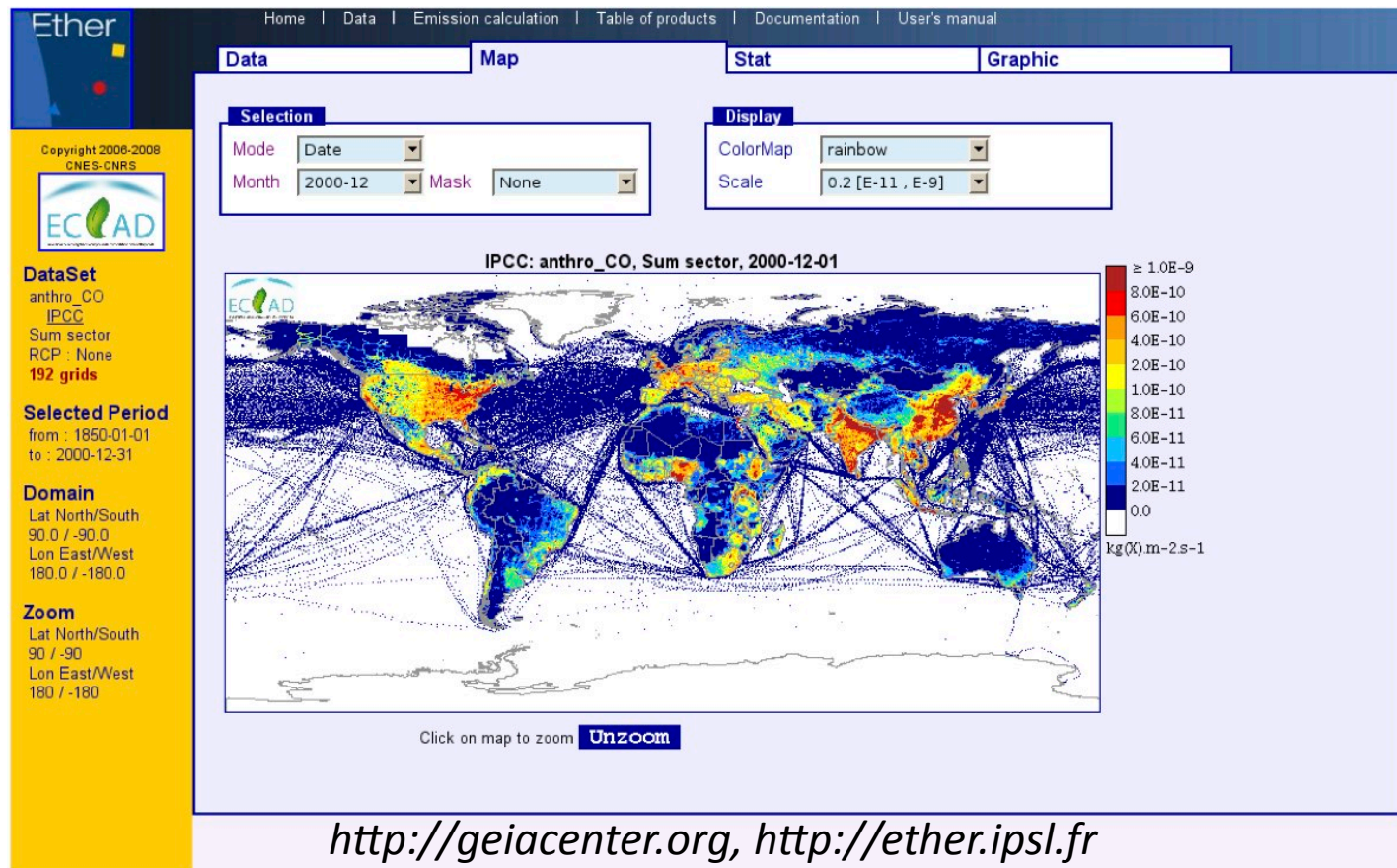


*Kim et al., 2006*

# Exchange and Communication of Emissions Information

- Emissions data accessibility
- Improved links to inventory, observation, model data
- Better communication between research and inventory development

## GEIA Emissions Portal and ECCAD/Ether Analysis Site



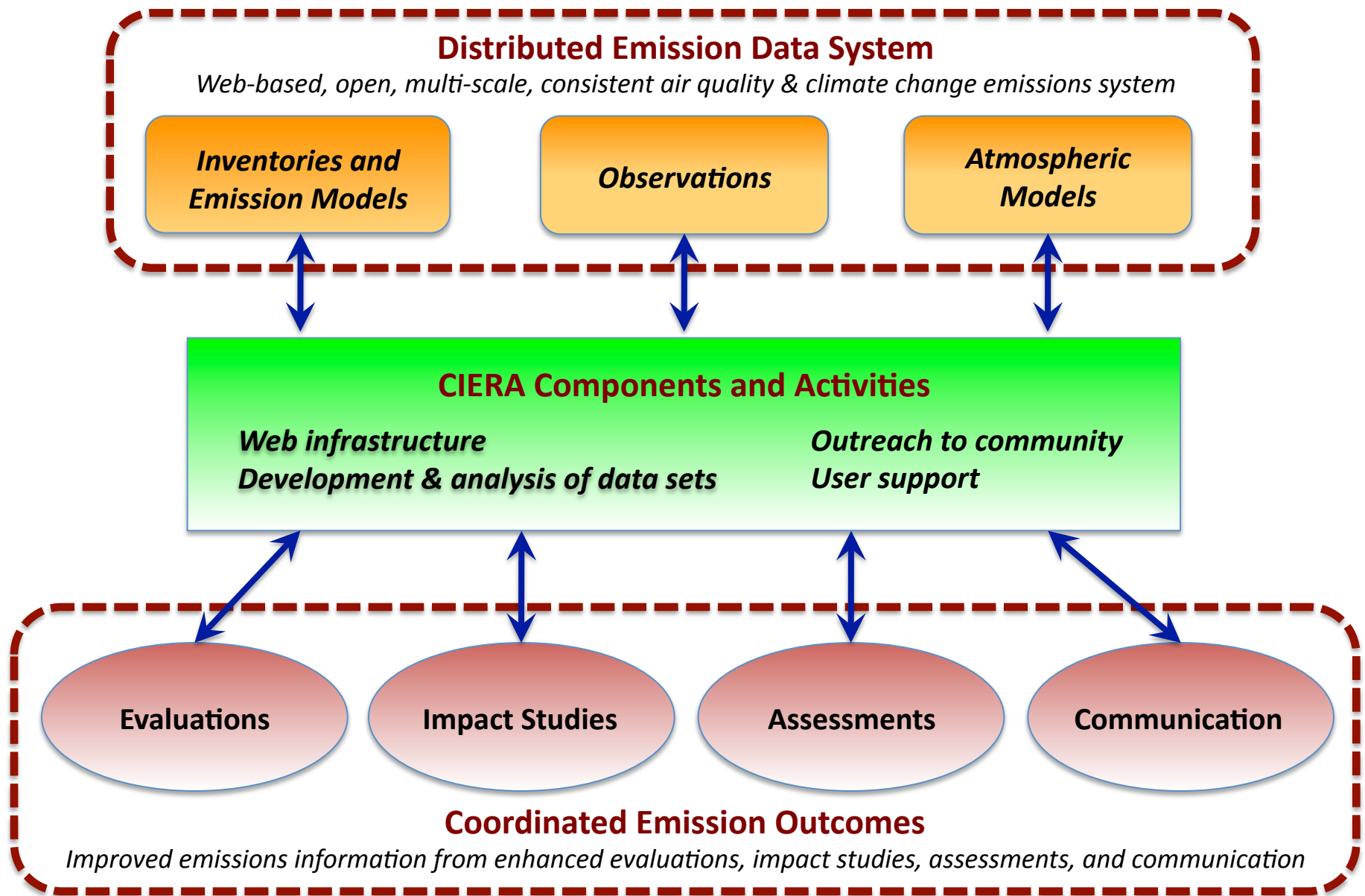


# CIERA Vision

*CIERA is building an international community to catalyze emissions research by facilitating:*

- the consistent, timely, and transparent development of emissions inventories at all scales*
- evaluations and analyses of emissions datasets*
- the exchange and communication of emissions information*

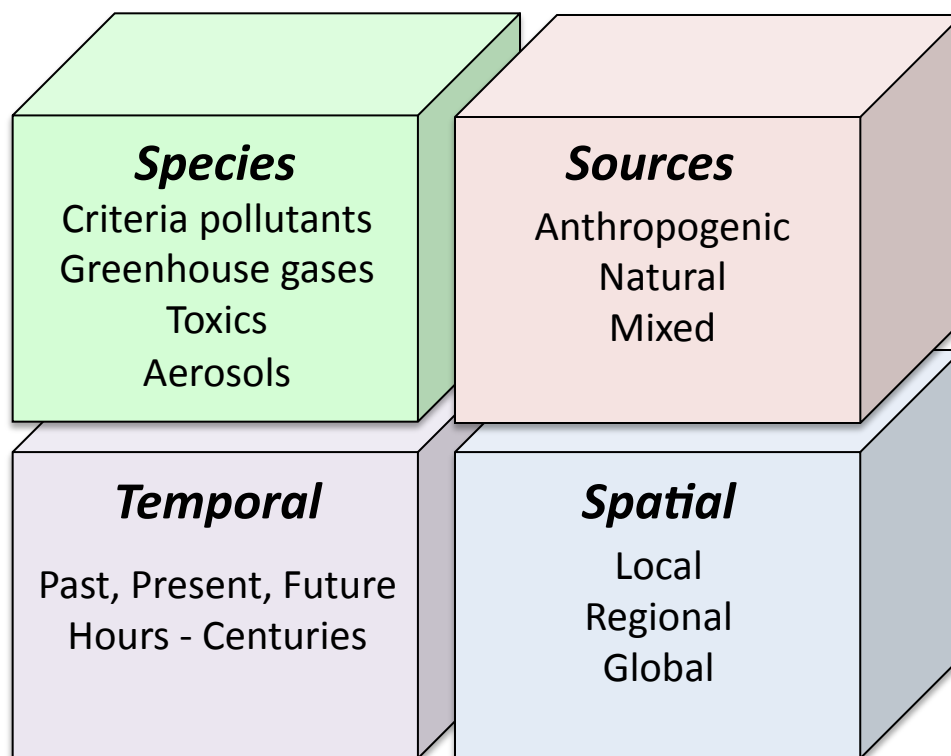
# CIERA Vision





## CIERA Scope

Emissions for air quality, climate, and their interconnections




## CIERA Community



- International
- Air quality and climate
- Modeling, observations, inventory development, and policy-making
- Government, academia, and private sector
- Enhance communication and feedback between emission research and inventory development

# CIERA Web Site

<http://ciera-air.org>



## Community Initiative for Emissions Research and Applications

[Home](#) [About](#) [Wiki](#) [Blog](#) [Forums](#) [Data](#) [Analysis](#) [Help](#)

### Navigation

- [Create Content](#)
- [Tags](#)
- [Recent posts](#)

### Welcome

[View](#) [Statistics](#)

This is a collaboration space for the Community Initiative for Emissions Research and Applications (CIERA).

### Search

**NOTE:** We are having problems with login. Please login [here](#) and then click [here](#) to return. We are working to fix this problem and apologize for the inconvenience.

### Statement of Purpose

CIERA is building an international community to catalyze emissions research by facilitating:

- the consistent, timely, and transparent development of emissions inventories at all scales;
- evaluations and analyses of emissions datasets; and
- the exchange and communication of emissions information.

### Join the community:

- [Recent site activity](#)
- [Register](#) in order to participate in site
- [Add Content](#) to the site
- [Related efforts](#)
- [News from other sites](#)
- [Calendar](#)

### Upcoming Events

*There are no upcoming events.*

### Who's online

There are currently *0* users and *0* guests online.

# CIERA Web Site

## Datasets:

NEISGEI - <http://www.neisgei.org>

GEIA - <http://geiacenter.org>

Emissions Data Services						
Add Data Service						
Name	Description	Provider	Originator	Spatial Coverage	Temporal Coverage	Notes
US NEI	US National Emissions Inventory for Point, Area and Mobile sources.	NEISGEI	EPA - OAQPS	US	2005-01 - 2005-12	
EDGAR_WCS	Emissions Database for Global Atmospheric Research (EDGAR) v3.2	GEIA	Netherlands Environmental Assessment Agency	World	1990-01 - 2000-01	The web service will be updated for EDGAR v4 when available.
RETRO_ANTHRO	Global gridded datasets for anthropogenic emissions of several trace gases covering the period...	GEIA	RETRO	Global	1960-01 - 2000-12	
RETRO_FIRES_WCS	Global gridded datasets for biomass fire emissions of several trace	GEIA	RETRO	Global	1960-01 - 2000-12	

# CIERA Web Site

## Analysis Tools:

NEISGEI - <http://www.neisgei.org>

ECCAD - <http://ether.ipsl.fr>

The screenshot displays the CIERA Web Site Grid Comparison Tool interface. At the top, a large map of North America shows a grid of colored squares (red, orange, yellow, green, blue) representing data values. A legend on the left side of this map provides a color scale from -10000000 to 10000000. Below the main map are two smaller maps, each with its own control panel. The left map's panel includes a 'Dataset' dropdown set to 'EDGAR\_WCS.CO', a 'Time' field set to '1990-01-01 00:00', and a 'Scale' field set to '0' with a unit of 'kg'. The right map's panel has a 'Dataset' dropdown set to 'EDGAR\_WCS.CO', a 'Time' field set to '1999-12-31 00:00', and a 'Scale' field set to '0' with a unit of 'kg'. Both panels have 'Update', 'Export', and 'Metadata' buttons. To the right of the maps is a 'Grid Comparison Tool' section with instructions, an 'Expression' field set to 'cust1' and 'b-a', a 'Scale' field set to '-1E7' and '1E7', and a 'Resolution' dropdown set to 'use coarser'. Below these are 'Calculate', 'Export', and 'Save Analysis' buttons. At the bottom right, there are 'Options', 'Open Analysis', and 'Help' buttons, followed by a 'Map Sync Between A&B' section with radio buttons for 'None', 'Time', 'Scale', and 'Both'. Below that is a 'Base Map' section with radio buttons for 'OpenLayers WMS', 'Google Street', 'Google Satellite', 'World borders', and 'North American borders'.

### Grid Comparison Tool

In the maps, select the gridded datasets to compare. Set your comparison expression and calculate the results to be shown in the map to the left.  
[More info](#)

Expression:   ⓘ  
Scale:    
Resolution:

[Calculate](#) [Export](#) [Save Analysis](#)

[Options](#) [Open Analysis](#) [Help](#)

#### Map Sync Between A&B

☒ None  
☐ Time  
☐ Scale  
☐ Both

#### Base Map

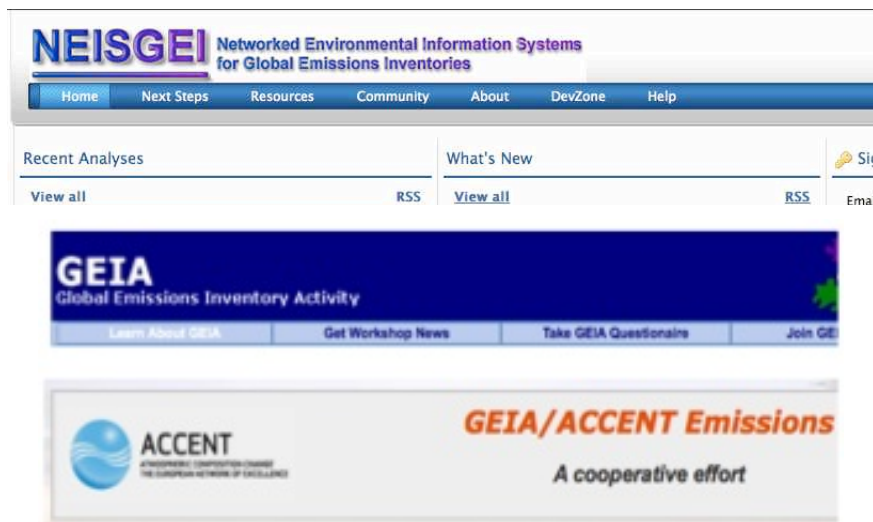
☒ OpenLayers WMS  
☐ Google Street  
☐ Google Satellite  
☐ World borders  
☐ North American borders

Dataset:   
Time:   
Scale:   kg  
[Update](#) [Export](#) [Metadata](#)

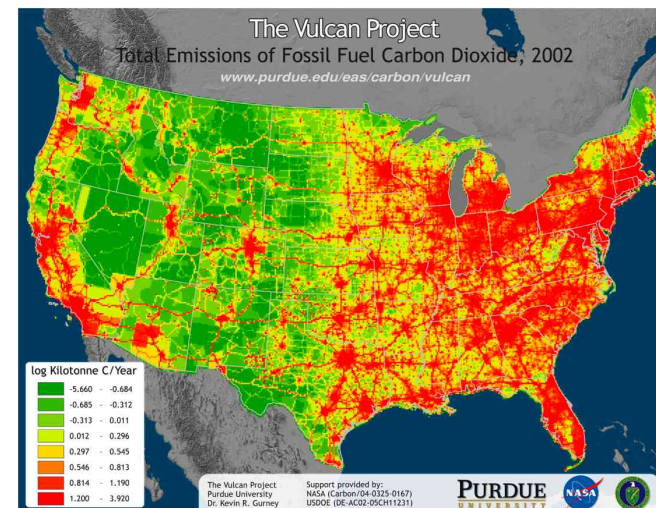
Dataset:   
Time:   
Scale:   kg  
[Update](#) [Export](#) [Metadata](#)

# Data Dissemination, Development, and Evaluation

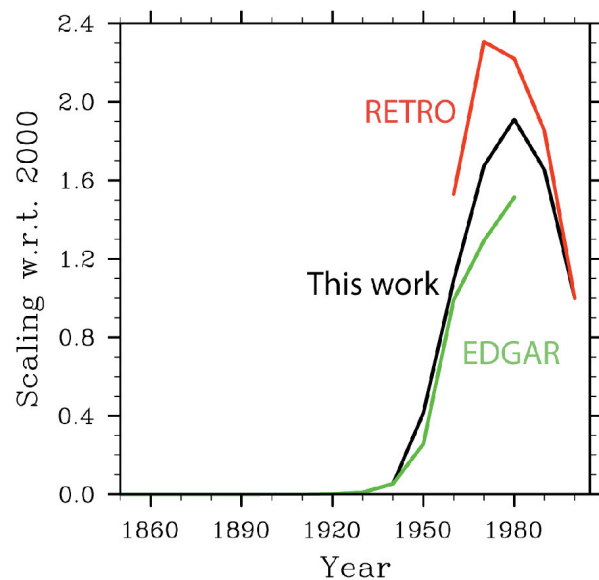
## NEISGEI and GEIA databases



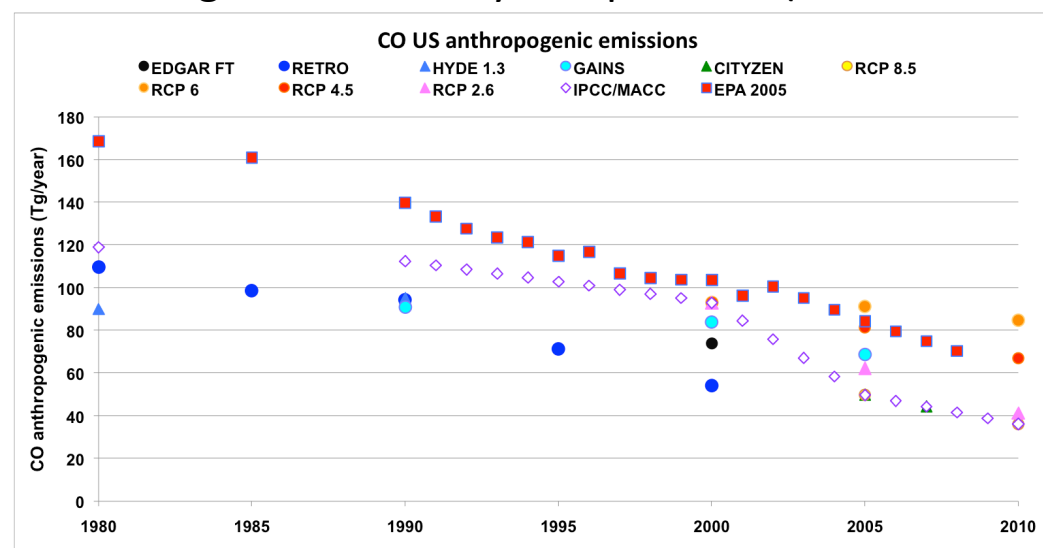
## Vulcan high-resolution CO<sub>2</sub> inventory



## CMIP5/IPCC AR5



## Global/regional inventory comparisons (Granier et al.)



# Communication of Ideas and Findings

- Conferences and workshops
  - Boulder Workshop, December 2009
  - EPA Emission Inventory Conference, San Antonio, September 2010
  - Fall AGU Meeting, San Francisco, December 2010
- CIERA vision paper (*Atmospheric Environment*)
- Bibliography of emissions literature
- White papers

[Home](#)

## Calendar

[Year](#) [Month](#) [Week](#) [Day](#)

[Table View](#)

September 2010							Next »
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
36				1	2	3 2010 Fall AGU Meeting – Abstract Deadline 09/03/2010 – 00:59	4
37	5	6	7	8	9	10	11
38	12	13	14	15	16	17	18
39	19	20	21	22	23	24	25
40	26 EPA 19th International Emission Inventory Conference 09/27/2010 – 09:30 – 09/30/2010 – 13:00	27 EPA 19th International Emission Inventory Conference 09/27/2010 – 09:30 – 09/30/2010 – 13:00	28 EPA 19th International Emission Inventory Conference 09/27/2010 – 09:30 – 09/30/2010 – 13:00	29 EPA 19th International Emission Inventory Conference 09/27/2010 – 09:30 – 09/30/2010 – 13:00	30		



# Community Participation is Essential

## ***How You Can Be Part of CIERA***

- Use and give comments on the CIERA web site
- Bring datasets and tools to CIERA system
- Use CIERA system to compare and evaluate emissions datasets
- Contribute to CIERA-sponsored sessions at upcoming conferences
- Form and participate in CIERA working groups
- Contribute to future CIERA white papers and publications

*Air quality and climate research and inventory development are interdependent.  
We have to work together!*

## CIERA Contacts

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